Space Weather Forecast

Issued on Monday, 13 June 2022 at 13:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class X-ray flares. Chance of G1/Minor Storms mainly Day 3 (15 June).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was Moderate in the last 24 hours, with a long duration Moderate-class flare that peaked around 13/0400 UTC, originating from the northeast quadrant. There are now seven sunspot regions on the visible disc, the most complex of which is the region responsible for the recent flare. Two regions were showing signs of decay. A further three regions near the east limb are all still difficult to classify due to the viewing angle. Another new region has emerged near south centre disc. A large Coronal Mass Ejection (CME) was observed in association with the recent flare. Analysis of this is ongoing, but the bulk of the ejecta is likely to miss behind Earth's orbit, with a chance of a glancing blow at Earth, perhaps on 15 June.

Solar Wind / Geomagnetic Activity: The solar wind speed showed an ongoing coronal hole fast wind. Wind speeds rose slightly from just above 450 km/s to vary between 500-550 km/s. Total Interplanetary magnetic field strength has been moderate but on a slight declining trend, with the north-south component varying moderately. Geomagnetic activity was Quiet to Unsettled, with a G1/Minor Storm interval between 13/0300-0600 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms detected.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be mainly Low through this period, with Common-class flares expected and a chance of Moderate-class flares.

Solar Wind / Geomagnetic Activity: A large CME was observed in association with the earlier long duration M3 flare. Analysis of this is ongoing, but the bulk of the ejecta is likely to miss behind Earth's orbit, with a chance of a glancing blow at Earth, likely early on 15 June. Solar wind speeds are currently elevated under the influence of a coronal hole fast wind. They are likely to decline somewhat to slightly elevated levels through the next two days. They are expected to rise again on Days 3 and 4 (15th and 16th) to elevated levels, under the influence of a further coronal hole fast wind. Geomagnetic activity is expected to be mainly Quiet to Unsettled with a chance of Active intervals. There is just a slight chance of G1/Minor Storms due to coronal hole influences, then a chance of G1 if we do see a glancing blow from the CME mainly on Day 3.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	5	5	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	35	40
Very Active	R3 to R5 X	No	5	5	5	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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